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FIG. 1A

OOH

anthraflavic acid

9-anthracene carboxylic acid 2

9-anthracene methanol 3

9-anthracene ethanol 4

9-anthracene propanol

9-anthracene butanol

FIG. 1F

SO₃Na

$$N=N-\sqrt{\frac{O}{C-O(C_3H_6)Si(OC_2H_5)_3}}$$

primuline

4-methoxyphenylazobenzene-4-carboxy propyl triethoxysilane

41

FIG. 1B

2-hydroxy-4-(3-triethoxysilylpropoxy)diphenylketone 10

2-hydroxy-4-(3-tributoxysilylpropoxy)diphenylketone 12

rosolic acid 14

trimethoxysilylpropyl-1,8-naphthalimide

2-hydroxy-4-(3-trimethoxysilylpropoxy)diphenylketone 11

2-hydroxy-4-(3-tripropoxysilylpropoxy)diphenylketone 13

triethoxysilylpropyl-1,8-naphthalimide 15

tripropoxysilylpropyl-1,8-naphthalimide

17

FIG. 1C

OCH₂Si(OC₂H₅)₃

 $O(C_2H_4)Si(OC_2H_5)_3$

 $O(C_4H_8)Si(OC_2H_5)_3$

9-anthracene carboxy-methyl triethoxysilane (TESAC) 18

9-anthracene carboxy-ethyl triethoxysilane 19

9-anthracene carboxy-butyl triethoxysilane 20

 $O(C_3H_6)Si(OC_2H_5)_3$

O(CH₂)Si(OCH₃)₃

O(C2H4)Si(OC4H9)3

triethoxysilane (TESAC) 21

9-anthracene carboxy-propyl 9-anthracene carboxy-methyl trimethoxysilane 22

9-anthracene carboxy-ethyl tributoxysilane 23

O(CH₂)Si(OC₃H₇)₃

O(C₃H₆)Si(OCH₃)₃

 $Si(OC_2H_5)_3$

tripropoxysilane 24

9-anthracene carboxy-methyl 9-anthracene carboxy-methyl trimethoxysilane 25

phenyltriethoxysilane 26

Si(OCH₃)₃



Si(OC₃H₇)₃

Si(OC₃H₇)₃

phenyltrimethoxysilane 27

phenyltripropoxysilane 28

phenyltriethoxysilane 29

FIG. 1D

10-phenanthrene carboxy-methyl triethoxysilane 29

10-phenanthrene carboxy-ethyl triethoxysilane 30

10-phenanthrene carboxy-methyl trimethoxysilane 31

10-phenanthrene carboxy-propyl triethoxysilane 32

4-phenylazophenol 33

4-ethoxyphenylazobenzene-4-carboxy methyl triethoxysilane 34

$$\text{H}_3\text{CO} \longrightarrow \text{N=N} \longrightarrow \overset{\text{O}}{\text{C-O}} (\text{C}_2\text{H}_4) \text{Si}(\text{OC}_2\text{H}_5)_3$$

4-methoxyphenylazobenzene-4-carboxy ethyl triethoxysilane

FIG. 1E

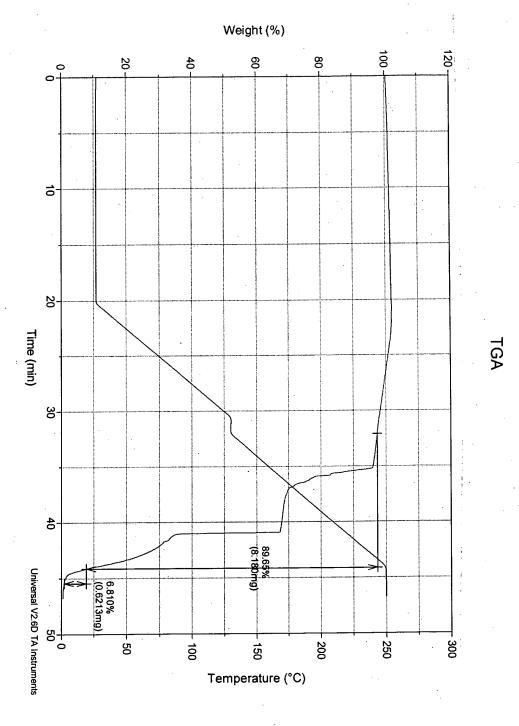
4-ethoxyphenylazobenzene-4-carboxy propyl triethoxysilane 36

4butoxyphenylazobenzene-4-carboxy propyl triethoxysilane 37

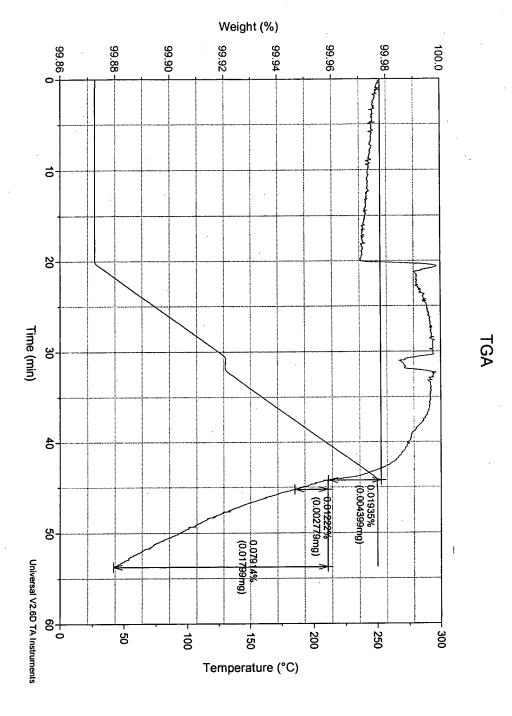
4-methoxyphenylazobenzene-4-carboxy methyl triethoxysilane 38

4-ethoxyphenylazobenzene-4-carboxy methyl triethoxysilane 39

4-methoxyphenylazobenzene-4-carboxy ethyl triethoxysilane



HOUR /



Tiguro 3

Weight (%)

98-

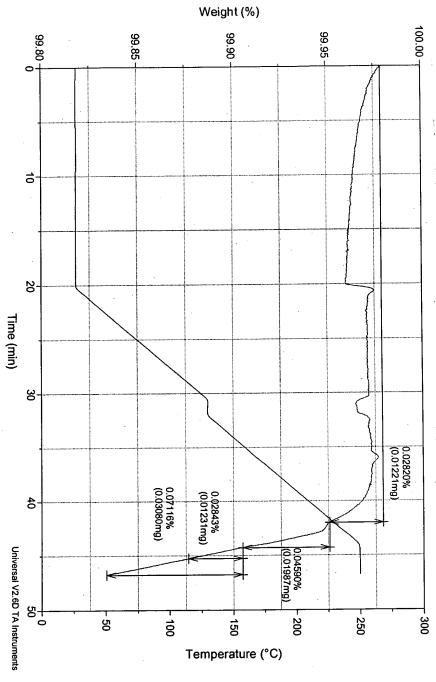
96-

94 0

TGA

100-

Flour 4



TGA

	Cescibaci		pake sednence	30 sec	500:1B0E 1 min	2 min 2 min	TMAH 1 min @	ų ir	2.3% aq. 50 TMAH 50		00000000000000000000000000000000000000	385	3.0% aq. 50 TMAH 50	1,37		1.73	<u> </u>	
45	<u> </u>			မ	<u>.</u>	٠ <u>=</u>	n@ Pre	23°C 3529	76.00 3534	75°C 3496		23°C 3526	50°C 3487	75 °C 35		23°C 34	50 °C 35	76.00
248 Absorbing	Composition	130/200°C	50 s	1224	1000	[880]	e ER		34 7.429	96 (TITLETS)		26 (* [3 98]	87 25/02	3530 88550		3497 >3497	3525 > 3,525	25.40 C. STATIO
€₹		2 5	50 sec each				Pre	(30) 2731	27.15	5 2720		8] 2705	<u>12</u> 2774	2709	1000	77. 27.24	211.	3
. 2	\$	150/250°C			260		ER	TO.	(5)	117		<u></u>	¹ શ	226	100 A	ঞ	THE STATE OF THE S	
193 Abso	Comp.	130/2					Pre	7934	2983	2702	2.5	2679	2723	2699	100	7897	0.292	
•	P. Rev A	130/200°C		2012	[1568]		ER		8	781	3,100	F	.,298	180	10 march 20	991	716	Y.XXX
193 Absorb	one contract	130/200°C					Pre	2691	2686	2720		2739	2702	2709		2702	2693	
	Comp. Rev (Comp	J _o C		248	306		ER		<u> </u>	8		77	(j) je	B	100	8	3	{
4550rb		130/240°C	*				Pre	2695	2701	2672		2693	2672	2725		2670	2679	
	Rev (r	၂္		133	201		ER			<u></u>		999				16		
193 Absurb. Comp. Rev C	(no acetone) + 5% DPG	130/200°C					Pre	2312	2331	2323		2311	1351	2361		2318	2327	
		၁့	90 se	411	531	536	ER	Ž	(**)	Ø		(%)	e e	120	*	O		
193 Absarb Comp. +	383ppm TMAH triflate	130/200°C	90 sec each		F		Pre	0297	2693	2694		2012	2688	2686	200	2691	2693	
	_	၂			TBD		ER	Ø.					(§)	211	V.	120	156	973
195 Absarb 193 Absarb 193 AC + Comp. + Comp. + 383ppm TMA	383ppm TMAH triflate	130/240°C					Pre	2676	2663	2677		2716	2673	2673		2672	9997	3
\$ +	—-	ې		362	820		ER	100					R	130		@	8	700
193 Absu Comp.	1070ppm APTEOS triflate	130/240°C					Pre	2699	2705	2692		2698	2752	2685		2700	2576	
da +	pm triflate	ງ ວູ		933	[1030]	854	ER	3 2		143		23	(\$5°)	202		Ę,	1000	2000
193 AC. + 383ppm TMAH	triflate + 3% DPG	130/240°C			·		Pre	3543	3516	3588	Ī	3563	3519	3503	100 C	3469	3483	
+ Me	e + 3%	10°C		[1116]	[1069]		ER	3	9) <u>938</u> kg	\$3 33		129	03/03×	3033 ×		(1920)	>3000	0.000

		248 Absorbing Comp.	ing	1-23 25-30/27 20mp.	sovering somp.	193 Ab	93 Absorb. Comp.	193 A	193 Absorb. Comp.	193 Absorb. Comp	sarb.	193 Absorb. Comp.	serb.
Desc	Description				Rev C	APTEO	†1070ppm APTEOS triflate	APTE0	+1070ppm APTEOS triflate	+1070pp APTEOS triflate	+1070ppm S triflate	+1070pp APTEOS triflate + 1.5%DPG	+1070ppm striffate + sDPG
	Hd	Z	NYA	\ ₹	_	ľ	₽	V	⊽	7	_	\	
Rake S	Bake Sedilence	130/	130/200 C	130/1	130/160 C	130/1	130/160 C	130/2	130/200 C	130/240 C	40 C	130/200 C	00 C
	2211224	90	50 sec)6 	80s				
500:1	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	띪	Pre	H	Pre	Æ
BOE	ີ20 °C	3533	[873]	1676	268	2741	[860]].	2724	[1,07,4]	2737	[1026]	3211	[1632]
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	띪	Pre	띪
700 0	_23 °C	3527	E	1690	(6)	2720	•	2747	R	2710	8	3172	36
7.3% aq.	၁, 09	3524	572	1676		2722	দি	2729		2713		3199	30.72
	75°€	3540	((66)	1676	4B	2743	. 1277.	2743	A.S.	2692	Ō	3181	(A) (C) (C) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A
	23 º C	3534	\$4801	1681	©.	2701	(3)	2722	(X)	2702	(3)/-	3179	[539]
5.0% aq.	ှာ ၁ (၁ (၁)		887.6%	1676	(3)	2709		2717		2705	63	3183	(3)(83)
	. ⊃°37	3527	15.553%	1687	9	2715	272	2713	192	2671	. 150	3166	(S)
MATRIX.	THE STREET, SALES	N. COLLEGE SERVICE SER	- (*Eb)43K)	Market Week	PROPERTY OF SECTION SE	ACTUAL VALUE OF STREET	A STABLE IN	A. A	Co. O. Sec. Sec.	40.3000	**************************************	THE CONTRACTOR	
7000	_23 °C	3539	280,000	1690		2734	(S)	2741		2716	(),(3,()	3201	[B/3]
10.0% aq.	၁,09	3532	250000	1682	T. A.	2736	259	2749	224	2731	168	3173	SAIT/S
	75 ⁰େ	3533	>3.056	1674	*109	2701	515	2726	518	2731	394	3186	>S(1859)

		193 Absorb. Comp.	sorb.	193 Absa	Absarb. omp.	193 A	193 Absorb. Comp.	1431	193 Absorb. Comp.	193 Absovo. Comp.	bsovb.	60	193 Absorb. Comp.
Desc	Description	APTE0(+1070ppm APTEOS triflate + 1.5%DPG	+1070ppm APTEO triflate + 3%DPG	+1070ppm APTEOS triflate + 3%DPG	+1070ppr triflate +	+1070ppm APTEOS triflate + 3%DPG	170 Ammonii	+ 170ppm Ammonium Triflate	170ppm Ammonium Triflate + 3% DPG	+ opm onium 3% DPG	170ppm Ammonium Triflate + 3% DPG	+ ppm nium 3% DPG
	Hd	V	<1	 	-		<1		₽	∨	_	₹	
Rake S	Bake Sedilence	130/	130/240 C	130/200 C	00 C	130/	130/240 C	130,	130/200 C	130/200 C	00 C	130/240 C	40 C
	20125						80s				T		
500:1	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	띪
BOE	20°C	3214	[NES]	3507	्रियम्ब्रीः	3548	[E30[J]	2751	. (d/d/3).	2971	[fister]	2982	[0570]
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	띪	Pre	ER	Pre	ER
7 30/ 02	_23°C-	3218	123	3523	8	3564	9	2732	9)	2951	(E)	2972	900
Z.3 % aq.	2 ₀ 09	3184	·	3510	0)(0)	3529	(CO)(C)	2746	(cy)	2997	999	2960	42.1
	75°C	3202	\$600g	3505	30333	3519	(3)KPS<	2736	325	2977	SPOUT	2992	130.W
	23.0℃	3194	102	3533	(M/23)	3519	[482]	2744	(38)	2972	223	2952	r ro
5.0% aq. TMAH	ີ 20 ₀ C	3175	SOURS	3505	30E0E	3479	3000 × × × × × × × × × × × × × × × × × ×	2725	254	i	[2650]	2943	4070
	್ರ-22	3165	: 89063	3495	SS/1938	3487	>6/E	2750	558	2973	\$220KB	2953	:055.56
			12 C	100	You's cath			7 AUG	2.0	2	* 13¢	AL SEC.	
10.0% ad	_23 °C	3200	[592]	3563	[62205]	3496	(1046)	2702	124	2979	0.00	2949	.455
TMAH		3176	58000	3504	To:3X	3496	9079%	2761	619	2983	936763	2949	STOCK!
	_75 °C	3187	25010V	3534	\$25.50 \$1.50	3500	5,650,077	2766	991	2986	93.63	2992	×40002

		248 A	248 Absorb. Compos.	193 Abs. Comp.	हैं दे	193 Abso	193 Absorb. Comp.	142Ats	192Absorta Comp.	193 Ab	193 Absorb. Comp	193 Abs.	785. G	185	193 Absorb. Comp.
Description	ption			+1070ppm AF Triflate + 0.59	+1070ppm APTEOS Triflate + 0.5% DPG	*1070ppi APTEOS Triflate + 1.5% DPG	r1070ppm Triflate + DPG	1070ppm "optimized" APTEOS Triflate 0.25% DPG	1070ppm "optimized" TEOS Triflate + 0.25% DPG	.+ 1070ppm "optimized" APTEOS Triflate 0.5% DPG	+	+ 1070ppi "optimized" APTEO Triflate + 1% DPG	εs	"optimizec Triflate +	+ 1070ppm "optimized" APTEOS Triflate + 1.5% DPG
됩	_		N/A	v	⊽	₹		,	◊	\$		V	42	•	\$
2		- 130 - 130	130/200 C	130/200	200 C	130/200 C	S C	130/2	30/200 C	130/200 C		130/2	130/200 C	130/	130/200 C
Dake Sednence	aguanb	20	50 sec		8	90 sec					906	90 sec			
500:1	1 min @	Pre	ER	Pre	띪	Pre	똢	Pre	8	Pre	ER	Pre	ER	Pre	ER
BOE	ာ့ ဆ	3487		2869	(M409)	3177	[[(60]]]	2879		2902	([i(e02]]	2907	-[((6777)]-	2947	F [K850]
TMAH	1 min @	Pre	띪	Pre	ER	Pre	띪	Pre	띪	Pre	ER	Pre	ER	Pre	띪
	အဖင	3492	127	2847	(2)	3190	9	2854		2934	(B)	2957	(63	2960	8
2.3% aq.	အ ပ	3463	723	2886	8	3190	903)	2893	279	2887	447	2955	788	2968	735
	75°C	3494	(E)E(C)	2875	861	3203	>56706	2864		2885	STATE	2987	10.00	2984	
	3 ₀ 86	3496	18121	2893	<u>(ii)</u>	3182	98	2853	88	2898	9,6	2927	158	3038	258
5.0% aq.	ြန	3520	25.520	2857	356	3189	(3))%	2844	739	2910	(600)	2932	allessille	2973	(E66)
	ე,92	3506	>8,000	2858		3184	×3(8)	2850	ssam)	2926	5/25/26	2926	\$2026	3006	\$2003%
		10 C. L. Mark			771 108	953-171-146	40	10. SEEL SEE		A. S. C. S. 18	100	27 S 28 P	2	18 St. 18	
7000	. 23°C	3499	€0003%	2877	163	3187	7203	2871	715	2967	(1802 <u>z</u>]	2977	[2553]	2882	
TMAH	့ ၁, 09	3522	\$8.590	2848	0.000	3215	8550	2899	6387%	2906	\$2037	2942	araz.	2958	. (SEC.)
	ွှင့	3542	<i>di</i> 583	2851	155553	3186	25)(63)	2885	55553	2897	- (E. 1974)	2991	16333	2976	S2076

		193 Absorbing Comp.	. Ž	25.00 45.00 70.00 70.00	orb.	4550rb. Comp.	بوخ	193 Absorb Comp.	•	193 Absorb. Comp.		193 Absorb. Comp		193 Absorb. Comp.	કેં હ
Desci	Description	+ 170ppm Ammonium Triflate + 0.25% DPG	+ 170ppm m Triflate % DPG	+ 170ppm Ammonium Triflate + 0.5% DPG		170ppm Ammonium Triflate + 1% DPG	t pm m Triflate DPG	383ppm TMAH- MSA	+ TMAH- A	+ 383ppm TMAH- MSA + 1.5% DPG	+ TMAH- 5% DPG	+ 1070ppm APTEOS-MSA	+ opm S-MSA	+ 1070ppm APTEOS-MSA + 1.5% DPG	+ ppm -MSA + DPG
Δ.	H	\$	61	8	2	42	<u>.</u>	8		42	6'	\$		8	
Dake Co	Daka Sagilanca	130/200 C	00 C	130/200 C	00 C	130/200 C	00 C	130/200 C) C	130/200 C	00 c	130/200 C) O C	130/200 C	D C
S	221234			oes 06	26			,	oes 06	ား			oes 06	36	
500:1	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	띪	Pre	뜺
BOE	20,0℃	2804	[[4,02]]	2830	[1149]	2931	[1283]	2823	723	2816	895	2768	935	2839	1086
TMAH	1 min @	eld	R	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	띪
, ac	2,62	2786		2821	Ö	2924		2812		2828		2777		2834	8
2.3% aq.	၁,09	2827		2835	128	2881	201	2769		2810		2765	X	2831	@
	_76 °C	2762	415	2854	678	2897	14/1/82 P	2755	123	2848	293	2794	509	2812	507
	23 °C	2777	35.07.38	2841		2883	0)	2773	111	2811	23	2821	36.73	2868	
5.0% aq. ⊤M∧⊔		2785	206	2871	278	2903	464	2797	777	2852		2763		2871	115
	75 °C	2809	586	2843	867	2937	1827	2779	167	2824	457	2804	283	2848	695
	70.60	2788	400	28.40	8,	200K	203	07770	6,040	1600	25.00	3000	751/6/2	2011	200
10.0% aq.	8.0	240	30 J	2040	3/1	3334	3	2000		2700	070	2004	070		200
TMAH	ച ന	2781	ena (1100)	2846	61169 611696	2878	1932 #[2878] #	2799	441	2793	849 	2777	0-0 883	2847	357 (1515)
				٦		٦					Car Statement Consultation	3	P. Sammer Co.		

Table 8

		193 Absorto. Compos.	<u>ب</u> ب	193 Absorb. Comp.	<u>á</u> .	193 Absorb. Comp.	ھٰ۔	193 Absorb. Comp.	2 .	193 Absorb. Comp.	.6 ~	193 Absorb. Comp.		193 Absorb. Comp.	. ف <u>.</u>
Descr	Description	214c "optin APTEOS 0.16%	2140ppm "optimized" APTEOS triflate + 0.16% DPG	2140ppm "optimized" APTEOS triflate 0.25% DPG	+ ppm ized" triflate + DPG	+ 170ppm "optimized" Ammonium triflate + 0.75% DPG	+ 170ppm lized" n triflate + n DPG	+ 170ppr "optimized" Ammonium triflate 1% DPG	+ 170ppm lized" n triflate +	+ 225ppm "optimized" Ammonium triflate + 0.75% DPG		+ 225ppr "optimized" Ammonium triflate 1% DPG	· F +	+ 340pm "optimized" Ammonium triflate + 1% DPG	+ 340ppm lized" n triflate +
٥	Hd	V	8	\$		8		\$	2:	4		8	C	4	
Rake Se	Rake Secuence	130%	130/200 C	130/200 C	30 C	130/200 C	D C	130/200 C	2 g	130/200 C	D C	130/200 C) @	130/200 C	0.0
S S S S S S S S S S S S S S S S S S S	200		90 sec	cec			90 sec	ວອ			90 sec			oes 06	, s
500:1	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	H	Pre	器
BOE	. 20 °C	2970	[((627])	2933	* [0486] *	2933	-leven)	2696	Kiosiji	2902	((VZT/2))	2938	*[DECKED]	2970	[1693]
TMAH	1 min @	Pre	ER	Pre	띪	Pre	ER	Pre	ER	Pre	R	Pre	Æ	Pre	ER
230/ 22	့အ င	2995	8	7967	76	2905	(A)	2913	R	2920		2936	3	2949	8
TMAH	ွ ဖ	7366	248	2947	195	2929	171	2929	211	2908	167	2932	220	2951	215
	.75°C	2970	ો(લાક)	2946	(1)(3)	2914	((643)	2959	(KA)	2941		7967	(1569)	2998	(633)
700 1	23 °C	2959	- 137	2932	(133	2905	(3)	2924	(3)	2936	5	2929	133	2960	105
5.0% aq. TMAH	် လို	2968	591	2942	462	2915	405	2914	486	2923	412	2980	567	2991	548
	್ರ0		[2608]	2983	(1566)	2948	W (398-4	2932	[2/(88)]		E [1664]	2940	[2/66]		\$20K
		7. 10.00	f.					1	22	122			ij	STATE OF THE STATE	
10 0% 20		2982	186	2937	147	2915	33	2944	124	2919	124	2962	117	2989	189
TMAH	့ ၁ ဇ	3012	(1916)	2950	01(80)	2934	(1023)	2978	(1001)	2909		2908	(E.S)	3008	0.456
	್ದಾ 15	2966	\$50.00 	2971	SEETA	2879	3430	2923	S/20/K)	2932	E857/3	2937	25.257	2972	COLORS

		,				etronikous		,		i - o	Some Property		-6	e milite			e Marie Targe
143 Absorb. Comp.	+ 1600ppm "optimized" APTEOS triflate + 0.25% DPG	8	130/200 C		Pre ER	2984 [[[1565]]	e ER	2944 (3)	997 09	87 (((65/11)	2000				2360 222	2950 (100)	2960 5/2990
-40	APT 0				ď	29(Pre	83	8	2987	Ş	7987	2981		23	প্র	ଷ
193 Absorb. Comp.	+ 1600ppm "optimized" APTEOS triflate + 0.16% DPG	8	130/200 C	90 sec	ER	[1450]	ER	W	249	4 1000 E	100 CA 2000	487	# (1672)		158		11007534
\$\f	optimi triflate				Pre	2910	Pre	2909	2984	2925	2004	§ 8	7362		2947	2918	2967
13 Sowb. Comp.	+ 1600ppm "optimized" APTEOS triflate + 0.08% DPG	8	130/200 C		ER	[1351]	띪	2	166	893	Branch St	410	**1198		115	934	\$ (1/2/OT)
193 Absorb. Comp.	"optimize triffate + (£		i Pre	2884	l Pre	2919	908 	2885	707E		2307		5865	7834	2879
हुं ह	+ 1070ppm "optimized" TEOS triflate + 0.25% DPG	8	130/200 C		ER	[[1450]	ER		242	1606	400	88 88	12504		226	1648	\$2003
193 Absorb. Comp.	+ 1070ppm "optimized" APTEOS triflate 0.25% DPG	v	130/		Pre	2974	Pre	2956	2933	7887	7044	0267	2927		2956	2977	2939
ج م م	1070ppm "optimized" TEOS triflate + 0.16% DPG	2	130/200 C		E	11467	띪	(i)	175	2000	AND THE REAL PROPERTY.	456	1612		156	Ø	Taylor I
193 Absorb Comp.	+ 1070ppm "optimized" APTEOS triflate 0.16% DPG		130%	ວອ	Pre	2942	Pre	1282	2962	2916	0000	2062	2941		2917	2936	2914
4	+1070ppm d" APTEOS),08% DPG		30 C	90sec	ER	[1356]	ER	(8)	142	833	101	336	A Trzagg		132	851	(Kirg):
193 Absorb. Comp.	+ 1070ppm "optimized" APTEOS triflate + 0.08% DPG	8	130/200 C		Pre	2900	Pre	2885	2894	3925	2001	2874			2882	2870	7886
193 Absorb. Comp.	ppm nized" triflate +	8	130/200 C		쫎	[[384]]	ER		301	622		256	789		(3)	704	S(II) (S(S)) (S
542	1070ppm "optimized" APTEOS triflate + 0% DPG	V	130/2		Pre	2887	Pre	5866	2858	2002	2064	2848	2893		2850	2892	2893
۔ ف		NIA	130/200 C	50 sec	ER	[1013]	띪	134	: S08	#[2669]	AN SESO		>3998		>3663		
248 Absorb. Comp.		Z	130/2	8	Pre	3565	Pre	3544	3561	3598	3550	3539			3563	3580	3545
	ption	T	000	dnessee	1 min @	_20 °C	1 min @	್ಕಾ ೭೭	೨ ₀ 09	_76 °C	7000	ა ე ე	75°C		23,6	၁, 09	78℃
	Description	돐	0000	pave agnetice	500:1	BOE	TMAH	7000	2.3% aq. TMAH	3		5.0% aq.	TMAH		7000	TU.U% aq.	3

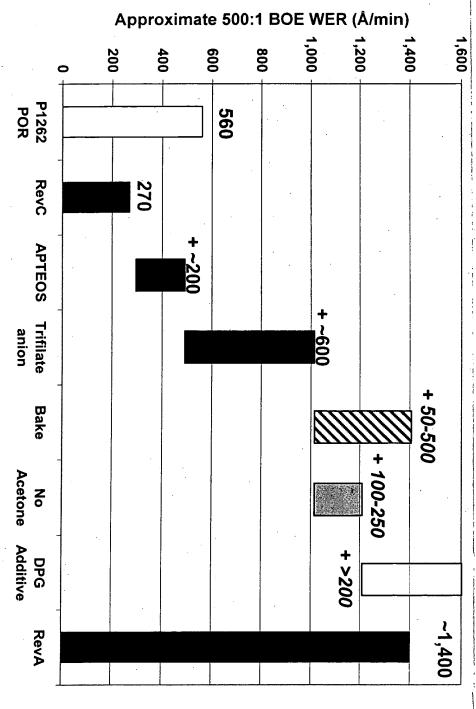


Figure 6

		25	(93	<u>6</u> 3	<u>8</u>	(43
		Absorb. Composition	Absorb. Comp.	Absorb. Composition	Absorb. Comp.	Absorb. Comp.
Descriptions	Total Total Control of the Control o		+ 1070ppm APTEOS tosylate	+ 1070ppm APTEOS tosylate	+ 1070ppm APTEOS tosylate + 5% DPG	+ 1070ppm APTEOS tosylate + 5% DPG
Hd		1.5	<1	<1	\ <u>\</u>	₹
Bake temp. (C)/Time (Sec)	(Sec)	150/250C 50sec	130/200C 90sec	130/240C 90sec	130/200C 90sec	130/240C 90sec
Metrics		ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)
O 10 0 11 4 11 1 10 10 10 10 10 10 10 10 10 10 10 1	1 min	210	12		23	81
2.5% IMAH @ 21 C	2 min	291	.12		42	
	30 sec	1224	1440	[088]	[2405]	1,[1799]
500:1BOE @ 21°C	1 min	1000	>1215	845	>1309	>1255
	2 min	[088]	>673	689<	959<	>652
A PROPERTY OF THE PARTY OF THE				The second secon		
ER:	ER: Etch Rate (A/min);	e (A/min);				
Pre:	Pre-Imme	Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;	ness in Angstrom;			
The second secon	ER > 1000A/min. FR < 1000A/min	0A/min. 0A/min				
^	> Bare Si post-etch.	ost-etch.				
	Post-etch	Post-etch film is highly non-uniformed.				

196 AttSovb. 196 AttSovb. 197 AttSovb. 198	[] Post-etch film is highly non-uniformed.
195 AbSolv Compos 383ppm TMA 41 130/240C -	-uniformed
Wb. RevA + WH triflate - 90sec min)	
92 Absorb. Composition RevA + 383ppm TMAH tosylate <1 130/240C 90sec ER (A/min) 689 647 665	

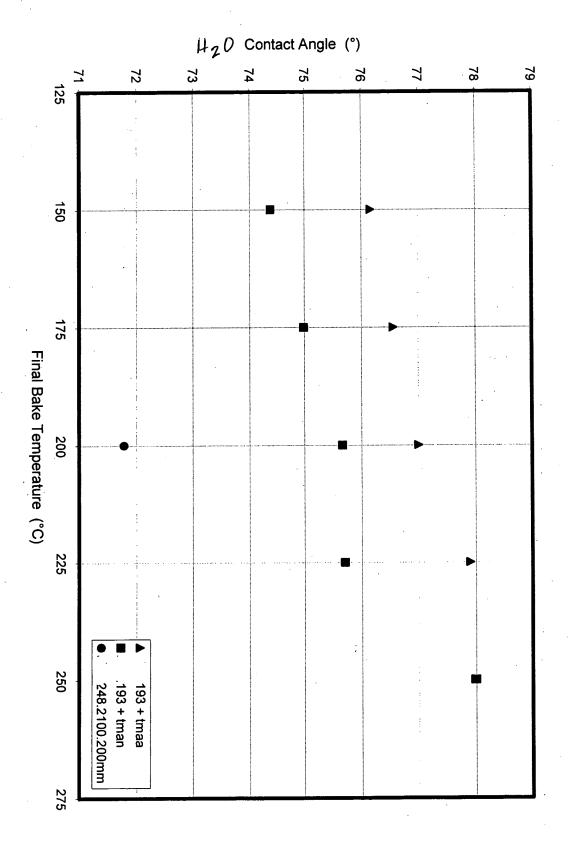
	"N" wt / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm) (consider 95% TMAA and 96% TMAN
AS_TMAA	589	4.422	4.201
TMAN	601.2	4.416	4.239

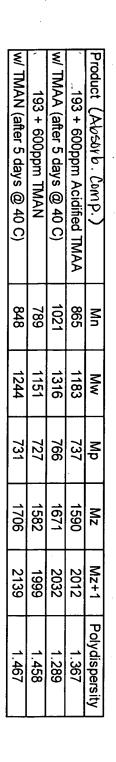
193 Absorbing Composition + TMAA

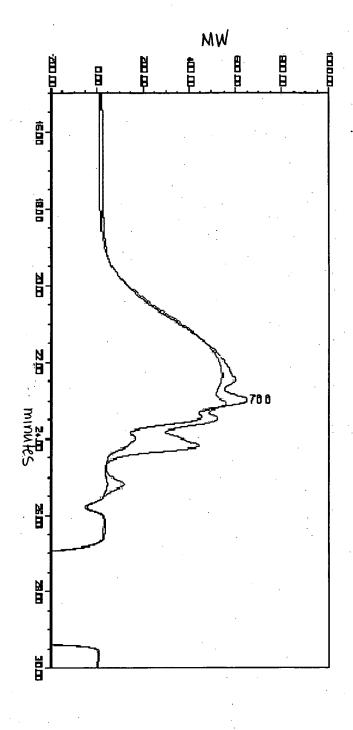
Bake temp. (C)/Time (Sec)	(Sec)	130/150C 90sec	130/175C 90sec	130/200C 90sec	130/225C 90sec	130/250C 90sec
Metrics		ER (A/min)	ER (Amin)	ER (A/min)	ER (A/min)	ER (Amin)
2.5% TMAH @ 21°C 1 min	1 min				2	"
PGMEA @ 21°C	6 min	7.0	9.0-	7'0	-0.2	60
TO 200	30 sec	856 - 4	.251	. 206	165	144 Sec. 1
SULTBUE (@ ZI C	1 min	ਮੁਣ _{ਵੱਧ ਵਿੱ}	273	*事件 215 ★ キュル	191	77.6

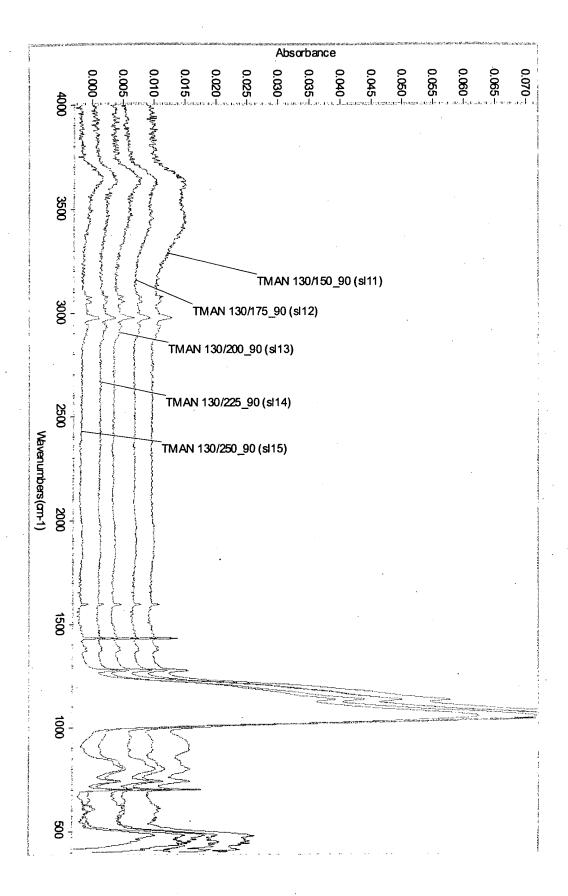
193 Aboor bing Comp. +TMAN

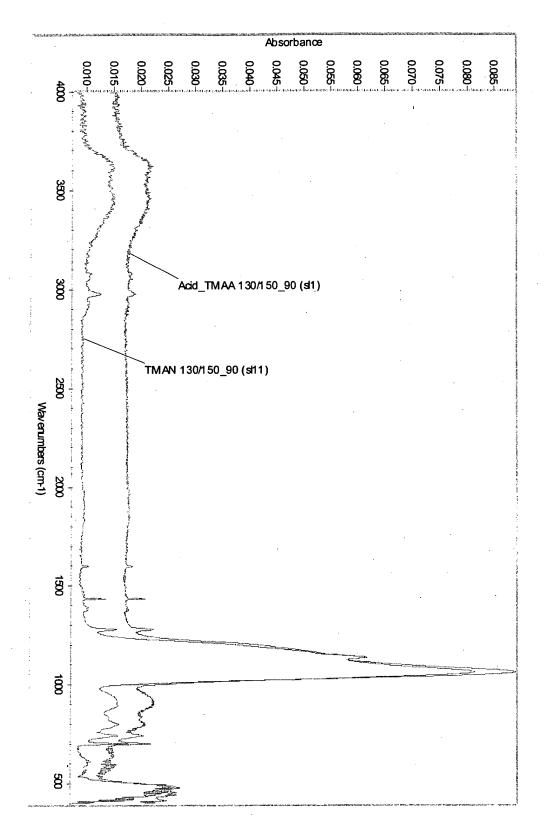
Bake temp. (C)/Time	(Sec)	Bake temp. (C)/Time (Sec) 130/150C 90sec	130/175C 90sec	130/200C 90sec	130/225C 90sec	130/250C 90sec	130/200C 60sec
Metrics		ER (Almin)	ER (Almin)	ER (Amin)	ER (Almin)	ER (A/min)	ER (A/min)
2.5% TMAH @ 21°C 1 min	1 min		E			•	882
PGMEA @ 21°C	6 min		-02	20.7	J.0		21
70070 E	30 sec	574	S. 1. 2. 403 12	261 🛬 📲	238	186 - 1	1/140 34
SUUTIBUE (@ ZI C	1 min	562	413	312	244	198 🔭	- 283
		Spin Coated @ 7F	@ 7PM on 5/22	PM on 5/22/03; Wet Process	. S		

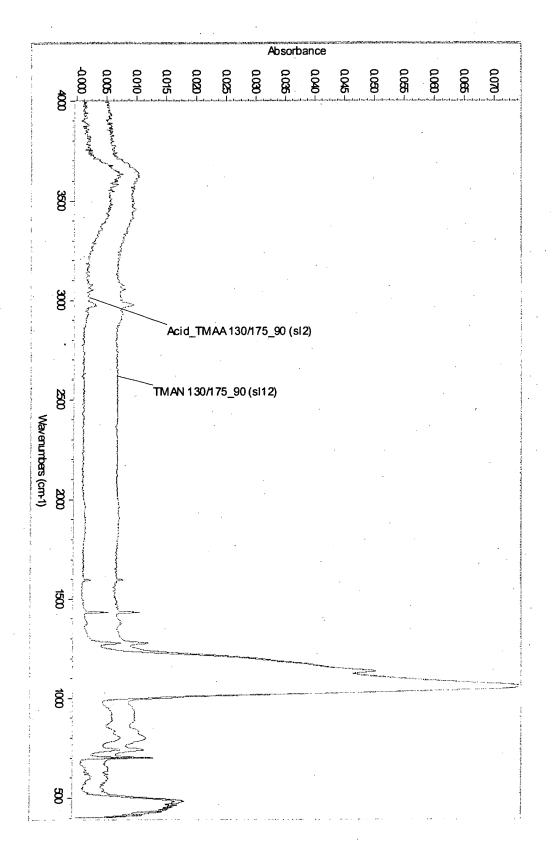


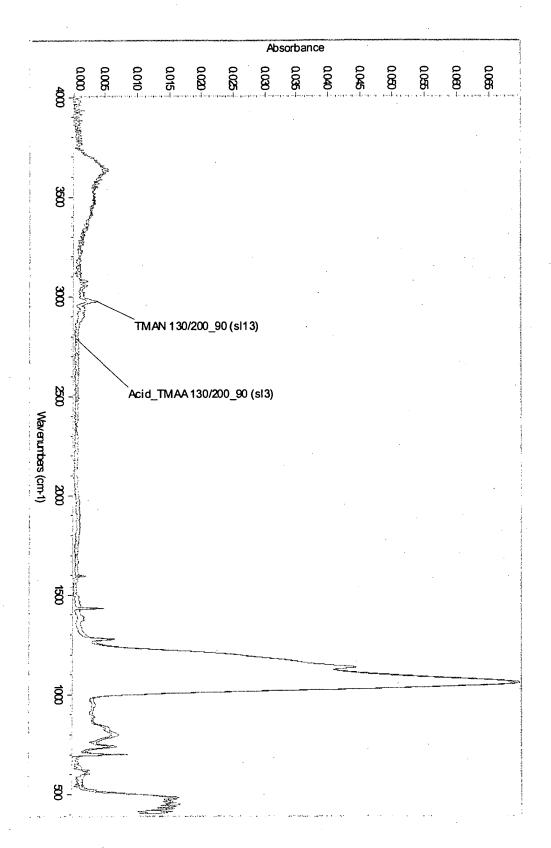


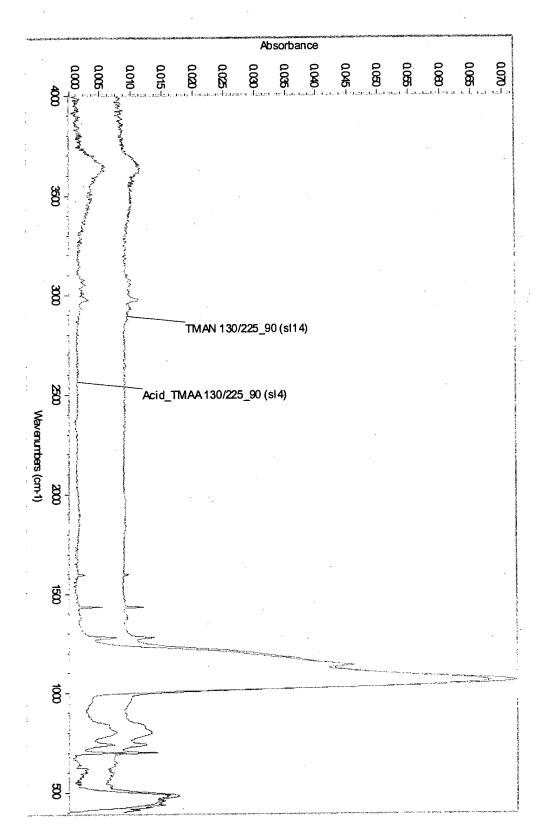


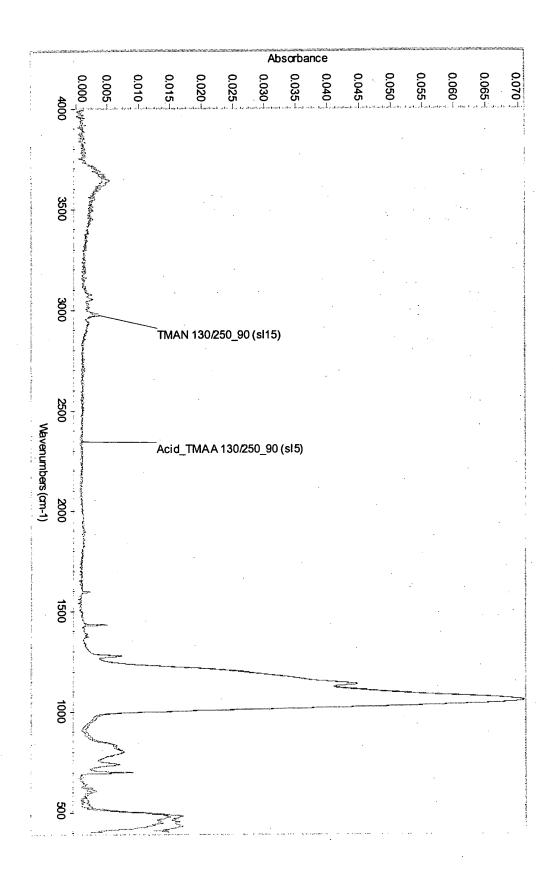


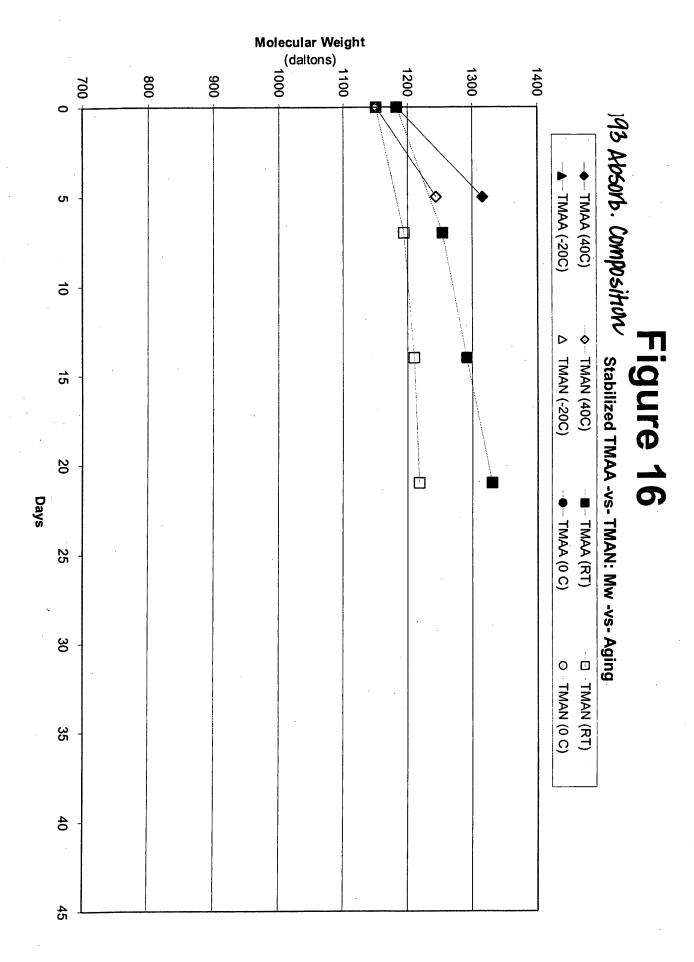


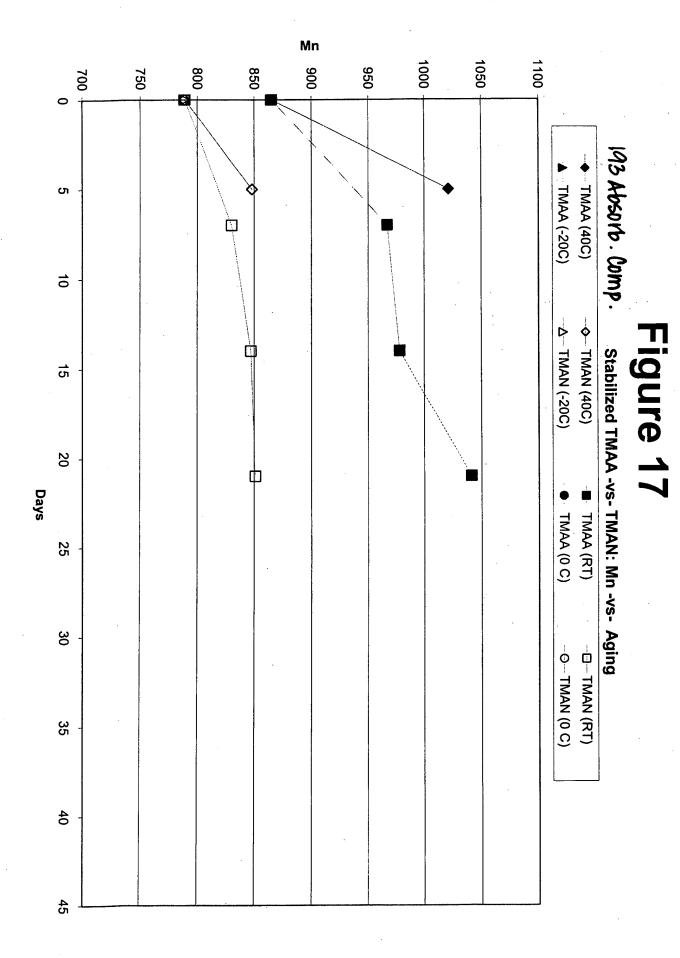








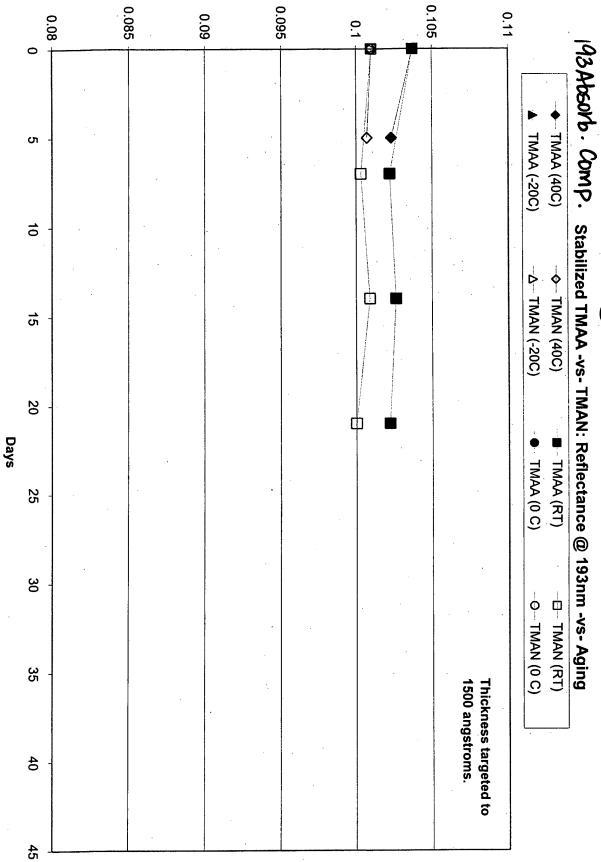




Thickness (angstroms) 1275 1325 1350 1225 1250 1300 1200 0 193 Absarb. Comp. → TMAA (40C) ▲ TMAA (-20C) Ŋ 6 Stabilized TMAA -vs- TMAN: Film Thickness -vs- Aging ♦ TMAN (40C) △ TMAN (-20C) 5 20 TMAA (RT) ---- TMAA (0 C) Days 25 မ TMAN (RT) O TMAN (0 C) 35 Spin Speed held constant @ 2000 rpm 40 45

Figure 18

Figure 19



Reflectance @ 193nm

1.81 1.78 1.79 1.82 1.83 1.8 193 Abs. Comp. → TMAA (40C) ▲ TMAA (-20C) Ŋ Stabilized TMAA -vs- TMAN: Refractive Index @ 193nm -vs- Aging

→ TMAN (40C) ———TMAA (RT) □ TMAN (RT) 6 △ TMAN (-20C) 5 20 \Box Days ● TMAA (0 C) 25 30 O TMAN (0 C) 35 1500 angstroms. Thickness targeted to 40 45

Figure 20

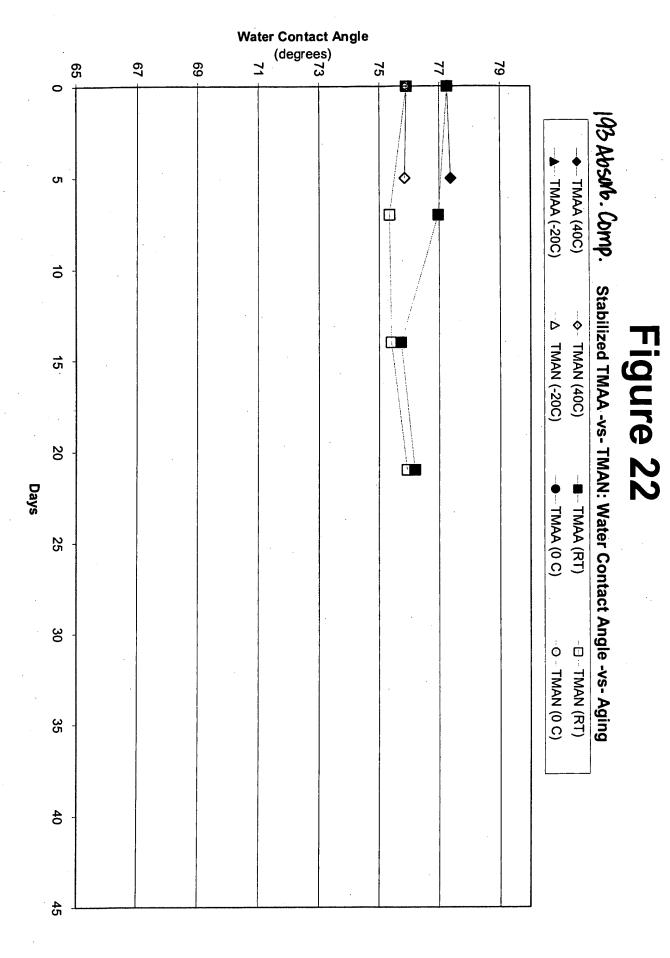
Refractive Index @ 193 nm

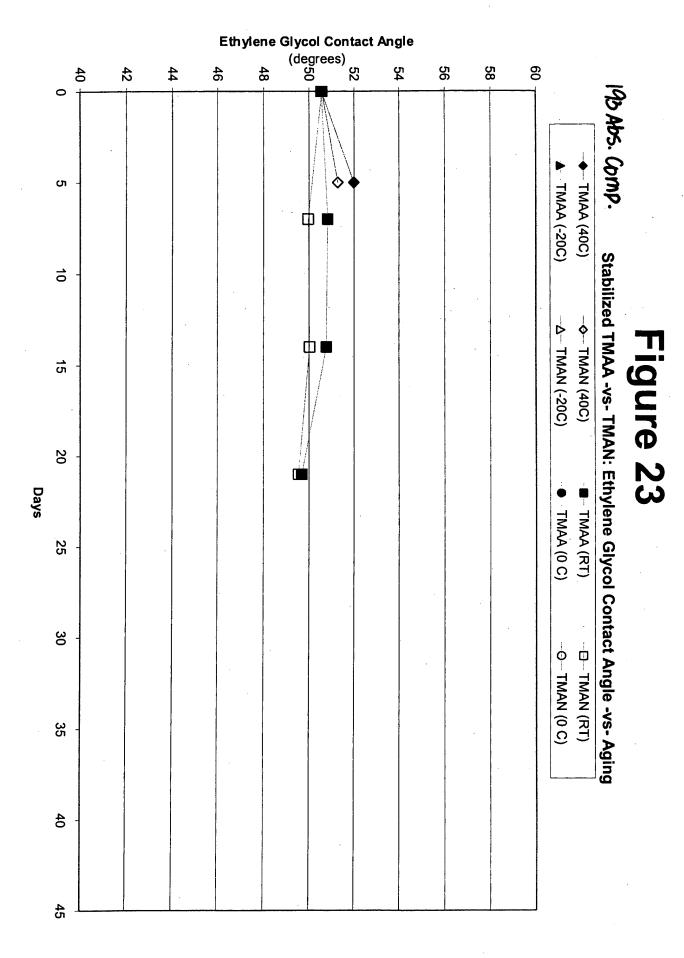
Extinction Coefficient @ 193 nm 0.425 0.375 0.475 193 Absorb. Comp. Stabilized TMAA -vs- TMAN: Extinction Coefficient @ 193nm -vs- Aging 0.275 0.45 0.25 0.5 0.3 —♦— TMAA (40C) ▲ TMAA (-20C) ഗ 5 -♦- TMAN (40C) _Δ TMAN (-20C) Figure 21 15 20 TMAA (RT)TMAA (0 C) 25 8 —З TMAN (RT) —З TMAN (0 C) 35 Thickness targeted to 1500 angstroms.

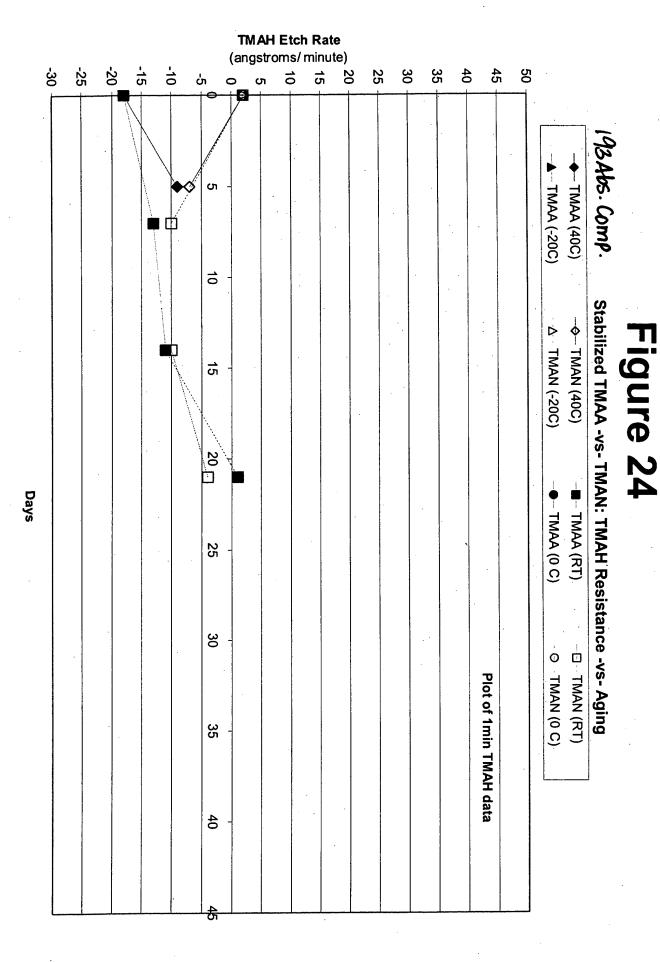
Days

40

45







Buffered Oxide Etch Rate (angstroms/ minute) 30 35 00 00 200 550 600 650 700 750 800 250 100 150 50 193 Abs. Comp. Stabilized TMAA -vs- TMAN: 500:1 BOE strip rate -vs- Aging ◆ TMAA (40C) ▲ TMAA (-20C) G 6 -- → TMAN (40C) —∆— TMAN (-20C) Figure 25 5 20 Days ■ TMAA (RT) TMAA (0 C) 25 30 TMAN (RT) O TMAN (0 C) Plot of 1min BOE data 35 40 45

		193 Absorbing Composition	Composition	1 248 Alos. Comp.
Descriptions		+ 600pm TMAN	+ 600ppm Stabilized TMAA	
Hd		1:7	0.5	N/A
Bake temp. (C)/Time (Sec)	(Sec)	130/240C 90sec	130/240C 90sec	130/200C 50sec
DIWater Contact Angle	ngle	78.7	78.9	74.9
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
	1 m in			45
2.5% TMAH @ 21°C	2 m in	C		
	30 sec	263	277	282
500:1BOE @ 21°C	1 m in	905		166
	2 m in	413	3.86	720

DIW ater Contact Angle	ngle	77.5	7.8	74.2
Metrics		ER (A/min)	ER (A/m in)	ER (A/min)
0 1 4 M H	1 m in	0 L-		11.
2.5% IMAH @ 21-C	2 m in	8. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		30
	30 sec	390		91/2
500:1BOE @ 21°C	1 m in	0.26	268	796
	2 min	370	23.0	Section of the sectio
Diwater Contact Angle	o lo	70.9	77.9	7.2
Metrics	2	ER (A/min)	ER (A/min)	ER (A/min)
	1 m in	01.		The state of the s
2.5% TMAH @ 21°C	2 m in			40
	30 sec	822	2.15	1865
500:1BOE @ 21°C	r E	0.00 7	408	796
	2 m in	SOLUTION SOL		2.50 J
DIWater Contact Angle	ngle	5.77	78.3	02
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
	1 m in	17.		96
2.3% IMAH @ 21 C	2 m in			96
	30 sec	2.6.6	256	935
500:1BOE @ 21°C	1 m in	326	274	912
	2 m ln			[T221

		248 ADS. COMP	193 Aborbing	193 Aborbing composition
Descriptions		t. ;.	+ 600ppm Stabilized TMAA	m d d 0 0 0 + T M V M L
Bake temp. (C)		130/200C	130/240C	130/240C
DIW ater Contact Angle	ngle			
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
	1 m in		A STATE OF THE STA	
2.5% TMAH @ 21°C	2 m in	The first of the control of the cont	-21.00	The state of the s
	30 sec	8 5	158	219
500:1BOE @ 21°C	1 m in	8.8.9		282
	2 m in	621	173	
,	30 sec	2.41		
NE-14 @ 21 C	1 m in	2815		
MARKET SERVICES SERVICES		A. S.	A SAME SAME	
DIW ater Contact Angl	n g le			
Metrics		ER (A/min)	ER (A/m in)	ER (A/min)
	1 m in			
2.5% TMAH @ 21°C	2 m in	49		
	30 sec		1.54 F. C.	2.61
500:1BOE @ 21°C	1 m in	9.2	186	303
	2 m in		188	320
	30 sec			
NE-14 @ 21 C	1 m in	2710		
	19.00 mm			
DIW ater Contact Angl	ngle			
Metrics		ER (A/m in)	ER (A/m in)	ER (A/m in)
010	1 m in	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	48 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2
2.5% IMAH @ 21 C	2 m in	8.0	A Company of the Comp	
	30 sec	8.3.9	165	234
500:1BOE @ 21°C	1 m in	272	188	Actor 282
	2 m in	91990	188	315
	30 sec	3040		
NE-14 @ 21 C	1 m in	2792		

		Absorb. Comp.	193 Absorb. Composition	mposition
Descriptions			+ 600ppm Stabilized TMAA	+ 600ppm TMAN
Bake temp. (C)		130/200C	130/240C	130/240C
DiWater Contact Angle	ngle			
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
O10 0 11 4 14 1 70 1 0	1 min	15.5 Control (1985)	$\mathbf{z}_{\mathbf{z}}$	
2.5% IMAH @ 21 C	2 min	99		
	30 sec	002	82015	184
500:1BOE @ 21°C	1 min	889	951	253
	2 min	109	891	286
0070 @ 77 LIN	30 sec	1732 - 1		
NE-14 @ 21 C	1 min	> 2835		

		Ş					•			
		\$	193	93 Absorbing Composition	ing C	ompos	ston	(,	
Desci	Description	248.2100.200m m	Rev A		•	+ 1070	ppm "optimiza	+ 1070ppm "optimized" APTEOS Triflate	riflate	
d	ЬH	N/A	1.5				<2			
Rake St	Bake Sentience	130/200 C	130/200°C	130/180 C	130%	130/200°C	130/220C	130/240°C	130/250C	130/280C
	aguanha.	50 sec	90 sec				oes 06			
500:1	1 min @	8	ER	ER	띪	E	E	뀖	ER	띪
BOE	20 °C	7.8	896111	16000	16880	1060		21.6	188 _{4 4.}	1058)
TMAH	1 min @	1 min @ ***********************************			T. P.					
7000	23 °C	979	**	88		5 5	(250
7.3% dq.	_2 ₀ 05 .	082	100	141	105	<u>(j)</u>	45	\$.00	6
<u> </u>	75 °C	(10gg)	781	262	622	446	372	228	179	129
6										
20 700 9	23 °C.	34.2 21	3	18	88		(E)	. <u>E</u>	300	0
J.U% dq. TMBH	ວ₀ 0 ⊊	>359D	298	347	526	. 222	123	(8)	S	90
	75 °C	>3000	(खाइ	12073)	789	782	624	.,406	321	211
				and the second second	14 A					* 174
10.0%	23 ºC) SEBJU	166	196	8	(99)	3	(2)	æ	- WE
aq.	− 50 °C	, 93 5 30	716	992	704	485	294	205	115	· 100
TMAH	2° 57	>3 ,57 71	CULTUS .	L CORRECTION	TRICKEN	(A.S.A.)	006	5 <i>P</i> 2		CEL

		>	061	The Magricular Composition.	y win pro	. 40111	
Desci	Description	248.2100.200mm		Rev A + 1070ppi	m "optimized" .	Rev A + 1070ppm "optimized" APTEOS Triflate + 1.5% DPG	+ 1.5% DPG
a.	рН	NIA	<2	<2	42	\$	8
Ba	Bake	130/200 C	130/180 C	130/200C	130/220C	130/240C	130/260C
Sed	Sednence	50 sec			oes 06		
500:1	1 min @	ER	ER	ER	ER	ER	ER
BOE	20 0€	(82)	. T40008 J	144(30)	[(4)282)]	[1. (0000)
TMAH	1 min @	出版の対象の対象を	建筑建筑建设	建筑在外域等			
2.5%	23 °C	2		×,	(A)	8	
ad.	ິວ ₀ 05∗	393	386	146	123		
TMAH	_2° €7	ටමස	045007	(K)(E)	(000)	290	538
Section 2		A STATE OF THE PERSON OF THE P	F		SECTION SECTIO	Sec. Of the Sec.	Name of the Part o
2.0%	23 °C	818	. 110	T.	20	, E	
ad.	೨ _೦ ೦೪	(10 93)	959	400		8	*
TMAH	⊃₀ 5 2	TOTES:	>286€	200326	(S)	006	856
40.000	20 0 C	EDIVE G	503	406	876	70	275
70.07 22.0%	2 62		200	200	275		€
a4.	၁ ၈င	(A)	6C6	400	C/7	\$2.	3
	ິນ 2002	(V/78/	(2007) (2007)	01/87/c	0777	(0.16)	(2007)

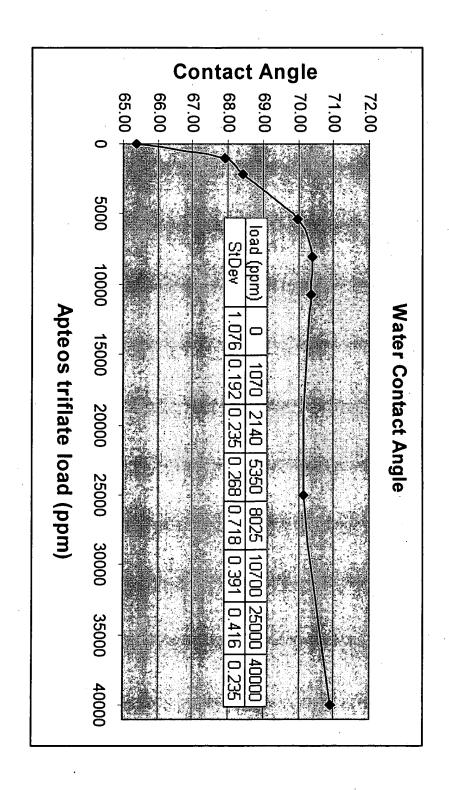
		₹	193	3 Absorbing		Composition	5		
Description	ption	248.2100.200m m	Rev		+	+ 1070ppm "optimized" APTEOS MSA + 1.5% DPG	zed" APTEOS M	ISA + 1.5% DPG	
Hd		N/A	1.5	<2	42	<2	<2	<2	<2
Doko Cognopco	90001	130/200 C	130/200°C	130/180 C	130/200°C	130/220C	130/240°C	130/250C	130/280C
Danc Sch	Haciace	50 sec	oes 06	oes 06	oes 06	oes 06	oes 06	oes 06	oes 06
500:1 BOE	1 m (6)	ER	ER	ER	ER	ER	ER	ER	ER
	20 °C	872	895])	[6339])	0800)	860	108	008	99/
TMAH	1 min @								
	23 °C	92	₩		280		· v	330	· ý
2.3% aq.	ວ, 0S	280	. 100	UGL*	(36)	9	3	3 0	H
	ე₀ \$ 2		787	(370))	205	518	5 POZ	242	226
				のなかないとなった。				Section of the second	
, ce	23 °C:		F	30	1977	. ♥.	**	(원)	<u> Di</u>
5.0% aq.	20 °C	(1848)S		777		3	G2	88	
\ \ \ \ \	್ರಿ ೭ ೭	>3£00	क्रिक्ष	0887 <	695	989	31.5	466	383
							ادفائد الألا		
704 41	. 23 °C	28,667.0		සි	3 20	(%)	9	*	(%)
10.0% aq. Taga u	2 ₀ ₀ C	SEE	912	906	387		**	592	(i)
	_75 °C	(VIII) 3	ODEC .	103873	(6)(9)	7/1/50	746	026	616
The state of the state of	The second second	A. A. A. S.	CARLES AND	A STANDARD STANDS	The second second second	The second secon	The second second	A	AND THE PROPERTY OF THE PARTY O

193	31	Hos	SÓY	Ь.	Co	m) <u>. </u>	
1070 ppm apteos msa + 1.5% DPG	Rev A +	triflate + 1.5% DPG	1070 ppm "opt" apteos	Rev A +	triflate	1070 ppm "opt" apteos	Rev A +	Materials

۵		۵		1.732		Hq
7	0	7	0	ĊΊ	0	Days at 40C
1006	880	1058	891	1062	780	Mn
1410	1241	1486	1269	1568	. 1109	Mw
1175	749	1198	754	1329	735	Mp
1887	1680	1995	1722	2188	1488	Mz
2364	2127	2520	2179	2853	1844	M ₂₊₁
1.402	1.41	1.404	1.424	1.476	1.422	PDI

No voiding	1641	1289	nitric acid acidified TMAA
			pH1.5 + 2000ppm
110 nm via fill	Μw	Mn	5 days at 400 /93AC

	_	248 74		661	Ab sov bing		Composition (AC)	N CAC.		
Description	tion	248.2100.200 mm		Rev A	pH 5.5	Rev A + 1070ppm APTEOS Nitrate	Rev A+ 1070ppm APTEOS Nitrate + 1.5% DPG	+ 1070ppm APTEOS Nitrate + 3% DPG	Rev A + 1070ppm APTEOS Nitrate + 6% DPG	Aev A + 1070ppm APTEOS Nitrate + 9% DPG
표		NA	1.	1.5	5.5	<2	42	<2	<i>t></i>	<2
Bake	•	130/200 C	130/2	130/200°C	130/240 C			130/240 C		
Sequence	nce	50 sec N2	90 sec N2	c N2	60 sec N2			90 sec N2		
500:1	1 min @	ER			ER	ä	Æ	æ	ER	ER
	20 °C	675		[1568]	612	422	[545]	571	- 189	626
TIMAH 1	1 min @		Pre	ER	4.0					
2.5%	23 °C	(3)	2694			8				(3)
S. OR	၁, 0၄	525	2663	100		9	6	•	8	9
TMAH	_2° €7	700 Res	2702	781	142	117	356	. 224	347	463
700	3°66	485	2679	DIN STATE	2018-12-12-12-12-12-12-12-12-12-12-12-12-12-		Section Same	Name of Street		<u>(i)</u>
1,662.	50 °C	T.	2723	298		20	Section 18		8	
	75 °C	3597	2699	** : :1212	339	119	805	259	524	9/2
H-			P			September 1985 September 1995		Programme of the State of the S	Mary Children and	
10.0%	23 °C		2687	166			7			
35/25	ີ 50 ₀ ຕິ	Section of the sectio	2670	716	142			106		
TMAH	75 °C	3514	2706	2,700	859	219		546		16/67/61/67/01/87/88



193	3ÅŁ	SUV	bın	9	a	on	np	•	
193 Rev A + 40000 ppm APTEOS Triflate	. 193 Rev A + 25000 ppm APTEOS Triflate	193 Rev A + 10700 ppm APTEOS Triflate		193 Rev A + 5350 ppm APTEOS Triflate	. 193 Rev A + 2140 ppm APTEOS Triflate	. 193 Rev A + 1070 ppm APTEOS Triflate	193 Rev A	Description	
1533	1500	1506	1512	1509	1514	-4502	1469	Thickness	
10.5	12.2	12.7	7.6	15.4	12.1	15.4	12.2	1 dev	
10.16	10.14	10.15	10.19	10.18	10.33	10.26	9.77	@ 193nm	Reflectance
1.7793	1.7998	1.7958	1.7918	1.7931	1.7945	1.8019	1.8027	n @ 193nn	

k @ 193nm 0.3811 0.3469 0.3304 0.3362 0.3329

0.3276

0.3526

0.3427

WEARSON AND AND AND AND AND AND AND AND AND AN			***************************************	***************************************			***************************************
			•		,		
ppm APTEOS Triflate	40C Aging	Mn	Mw	Мр	Mz	Mz+1	Polydispersity
193 + 1070ppm APTEOS Triflate	0	920	1283	1692	1724	2173	1.395362
	5	1279	1681	1405	2174	2706	1.314284
193 + 2140 ppm APTEOS Triflate	0	754	1119	744	1562	2000	1.483957
	5	955	1378	788	1897	2455	1.442483
7 193 + 5350 ppm APTEOS Triflate	0	928	1226	754	1640	2046	1.39940
	5	984	1367	6//	1819	2268	1.38917
7	0	877	1228	754	1646	2058	1.40051
	- 5	886	1369	1112	1812	2247	1.38518
.193 + 10700 ppm APTEOS Triflate	0	875	1226	755	1642	2052	1.40143
	5	1001	1396	1156	1860	2320	1.39492
193 + 25000 ppm APTEOS Triflate	0 -	846	1204	764	1635	2060	1.42421
	5						
193 + 40000 ppm APTEOS Triflate	0	835	1169	755	1558	1930	1.39928
	5	846	1260	773	1726	2168	1.489298

193 Absorb. Comp.

	1248 AC	6	193 Absu	193 Absorbing Composition	+15
Description		248.2100.200mm	Rev A	Rev A + 10,700 ppm APTEOS Triflate (10X)	m o
ΡĦ		NIA		<2.5	
Bake		130/200 C	130/200 C		130/240 C
Sequence		50 sec N2	90 sec N2		90 sec N2
500:1 1	1 min @	ER	R	ER	
		751	/ [16 <u>68]</u>	922	
TMAH 1	1 min @				
2.5%	23 °C	35	67 Tax 18 18 18 18 18 18 18 18 18 18 18 18 18	22 -	
147 4 7 1	50°C	493	100	8 A	100
TMAH	75 °C	1488	781		
		207	A Daniel Company		
ভাজ					
. leb. 19	50 °C	[16U4]	298	60	1
TMAH	75 °C 2	[2639]	1212	309	
10.0%	23°C	> 3491)	166	-8	
	50°C	× > 3427; × +	716	162	
HAMT	75 °C · · · · · · · > 0440 · · · · · ·	CONT	× 2706		

